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EDITORIAL NOTES

INCENTIVE AND RESULT

WE wrote in these columns a week ago that a combination of gas and coke is no more expensive to the individual consumer than raw coal, that for a given sum of money a consumer cannot gain more comfort by spending it on coal rather than on gas and coke—a fact which will eventually be recognized to the nation's advantage; a fact which will be recognized on the grounds of merit. This implies a measure of faith. We think we are right in having it and we have no hesitation in admitting it. Nor are we downcast by what has happened in the past and by regarding past facts squarely. A few weeks previously we were commenting on a Paper by Mr. Andrew ("JOURNAL" of Sept. 30), who recorded his experiences as a free lance, as it were, on the district. He found that money spent by the consumer on solid fuel was regarded as inevitable. Not so the pennies or shillings put into the prepayment gas meter. He found that the consumer had a very hazy conception of fuel costs, but that his major expenditure was on coal. This, we think, is an all-important point. We have had before us all sorts of economic surveys which show that most people have not a great deal of money to spend on fuel. It may be 4s. or 6s. a week; 6s., we think, is not an unreasonable figure to bear in mind. But, as far as it concerns the Gas Industry, the striking feature is that of that 6s. about 4s. goes in coal, and that, with gas at prices which the Industry can afford to supply, if that 4s. was spent on gas or on gas and coke the comfort results as far as the consumer was concerned would at least be equivalent. What we would stress, then, is that it is not so much what the consumer has available to spend on fuel, but the proportion of that amount which he is prepared to spend on the Gas Industry's smokeless products. At present the proportion is low. Wherein lies the remedy?

We turn to the Paper which Mr. Corrigan gave recently to the Manchester District Association and a substantial part of which we are publishing in the "JOURNAL." It was a long Paper, and to some it may appear a rather depressing and somewhat negative contribution. For ourselves, we like its frank admissions. In spite of them we are not downhearted, and we think the Paper will prove a useful reference because of its frankness. Brighouse, the Author explained, is a typical industrial area—that is, typical of the West Riding of Yorkshire. Those conversant with the West Riding will best understand what this short description means. There is plenty of cheap coal (we are thinking in terms of pre-war conditions), there are plenty of low rated houses, and the people are as hard headed as they are hard working. A decade ago the Brighouse Gas Department showed enterprise which before now has been the subject of record and comment in the "JOURNAL." In 1933 it introduced a compulsory, attractive block rate system of charge designed to attract substantial additional business from solid fuel. It was almost unique in this action—"almost," because we are given to understand that Macclesfield adopted a compulsory tariff on similar lines in 1922. At any rate, Brighouse was a good deal in the news at the time and has been much quoted since. We have said that the Brighouse tariff was attractive. The price was, in fact, competitive with solid fuel. It remains that in the sphere for which it was intended—displacement of coal by gas—it has not proved a success. *Yet the few consumers who substituted solid fuel by gas are entirely satisfied.* Their annual consumptions of from 400 to 1,000 therms of gas per annum indicate the potentialities of the business.

It should be noted that the tariff was not, so to speak, allowed to drift. The Brighouse Gas Department has pursued a vigorous sales policy over the whole of its period of operation. It was introduced at a time of intense electrical competition. It prevented a serious drop in the average consumption of the domestic consumer; it retained the cooking load. But gas still supplies only 25% of the domestic fuel needs. Out of a present average weekly expenditure on fuel of 7s. 5d. the consumer spends 5s. on coal, 1s. 3d. on gas, and the remaining 1s. 2d. on electricity. Pre-war the ratios were comparable. Over 95% of the Brighouse gas consumers still use coal in large or small quantities. Mr. Corrigan related—and this, by the way, was an experience shared by Mr. Andrew—that there is generally an element of suspicion as to the running costs of gas for prolonged periods of space heating, and the public do not understand relative fuel costs. They do not understand what "cheap gas" means. Apparently, he said, preference for the coal fire is something which cheap gas cannot overcome. We think that, in time, cheap gas will overcome this obstacle. It is a matter of education; and we are glad that, in concluding his Paper, Mr. Corrigan, in spite of his remarks on the apparent obstacle and the experience at Brighouse of a compulsory block rate charge for gas, should express his general conviction that gas can be placed in the domestic fuel market for all purposes at competitive prices, and that by a process of educating the country into a keener appreciation of the national values and individual benefits of a smoke-abatement policy the potential domestic fuel business will be gained. Of course, without attractive and maybe compulsory tariffs the Gas Industry cannot hope to make headway in this vast potential field; and in giving the Industry full information of the working of the Brighouse scheme Mr. Corrigan's Paper cannot be regarded as a negative contribution.

GAS COOKER RATIONALIZATION

WE like to think of standardization as planned variety where some variety is desirable, and it seems to us that there are many matters where variety is not only unnecessary but positively disadvantageous. There was an expression in the I.G.E. Committee's report on gas quality which appealed to us—that the idea of standardization *per se* has no intrinsic merit, and that consequently the value of any general standardization must be positive to the consumer, the supplier, or the nation. The I.G.E. Committee on the standardization of appliances ("JOURNAL" of Oct. 28 and Nov. 4) probably had a similar view in mind when, at the outset of its report, it defined "standardization" in engineering practice as implying interchangeability of all parts, irrespective of the maker, and suggested that anything short of this was not standardization but rationalization. The Committee approached its task from the two angles of the potential advantages and disadvantages of standardization on the one hand and rationalization on the other, and it came to the conclusion that standardization, even of one or two models—its findings are concerned solely with the domestic gas cooker—would not necessarily result in any marked reduction in first cost of the appliance. On the other hand, such standardization might be useful in dealing with housing authorities, architects, and the like, and in simplifying sales procedure.

It seems right to assume that after the war there will be a heavy demand for a low priced modern enamelled cooker to be supplied over a period of years to keep pace with the national building programme. The corollary to this is that the Gas Industry must be prepared to meet this demand. Even so, majority of opinion of the many witnesses was that standardization should be limited to appliances suitable for supply to prepayment consumers, leaving the field of the high-grade cooker free, and the view was expressed that consumers might be best served by the production of four or five different standard cookers, rather than by the production of one such standard only. It was suggested that the appliance makers themselves should form a holding company for the purpose of producing a standard cooker for prepayment consumers, each separate appliance maker being free to continue research and development for the production of high-grade models. Everybody was agreed that some standardization of components is a necessity, and that where such parts could not be completely standardized and made interchangeable as between one maker and another, each maker should at least standardize on component parts for his own models.

Starting *de novo* on this much discussed subject and with an open mind, the Committee came to its conclusions on the evidence put before it. That is the background of the report, and it is with this background in mind that the report must in fairness be judged. What it found was that there is no measure of agreement in the Industry in favour of a nationally standardized cooker. "At present"—we quote from the report—"no medium exists for the discussion of such matters of common interest to all members of the Gas Industry as the design and construction of domestic gas appliances." The Committee sees no prospect of agreement on a standardized cooker while the structure of the Industry remains as at present. At the same time, a modern vitreous enamelled cooker of low price is needed to replace existing black cookers; it will be required in large numbers after the war; the great majority of prepayment consumers will accept a cooker offered by the Industry provided it gives good performance, is easy to clean, and has attractive appearance. The small minority who will not accept such a cooker will be prepared to pay more for their own choice. And it is unanimously accepted by the Committee that the more expensive cooker should not be standardized, but that rationalization, as far as this is possible, should be applied to it.

The Committee concludes its report by asking that manufacturers of appliances and gas undertakings should get together and support this policy of rationalization. It is, in fact, towards rationalization, as distinct from standardization, that the Committee confines its recommendations, which in general may be summed up as being that each manufacturer should make the component parts of his own series of cookers as interchangeable as possible, and that he should reduce the number of models in production to a minimum. There should be no more than four sizes of domestic gas cooker (not more than three for the lower priced models). All gas undertakings, it is urged, should agree not to ask manufacturers to make minor alterations. Equally important, it is urged that all manufacturers should agree not to make any such modifications to their standard series of cookers to suit individual buyers. Alterations of existing models and the introduction of new models should be undertaken only when this is justified by improvements of real merit. There are a number of detailed recommendations in the report, such as that the calibration of setting and notation of thermostats should be standardized, that there should be standard gas pressure governors and fixed injectors, that left-hand hanging of oven doors should be standardized. We are left with such common-sense proposals based on evidence. It is to be hoped that gas undertakings and gas appliance manufacturers will work more in concert to put such recommendations into effect, for it is only by concerted action that recommendations of the nature can serve the purpose intended, which is the interest of the consumer, and through this automatically the interests of gas undertaking and appliance maker.

Personal

Mr. J. E. WAKEFORD, M.B.E., the Salford Deputy Gas Engineer and Manager, has been appointed Engineer and Manager of the Warrington Gas Undertaking. The undertaking is similar in size and output to that of Salford. Mr. Wakeford, who is 35 years of age, is a native of Bilston, Staffordshire. He received his training as a gas engineer at Stockton-on-Tees. He was afterwards appointed Deputy Gas Engineer and Manager at Brighouse, then in 1934 he went to Plymouth in a similar capacity. He went from Plymouth to Salford in 1937. Mr. Wakeford was appointed a Member of the Order of the British Empire in September, 1941, for his courageous conduct during an air raid.

* * *

As from Oct. 7 Mr. W. DIETERICHS resigned from the Chairmanship of the Industrial Gas Centres Committee, a yearly office which he has occupied for a period of ten years. His successor as Chairman is Mr. H. R. HEMS, of the Birmingham Gas Department.

* * *

To mark the retirement of Mr. WILLIAM MARSHALL, Gas Manager at Largs (Ayrshire), the officials, staff, and workmen of the burgh presented him with a clock, together with a plaque for Mrs. Marshall.

* * *

Mr. W. O. SHILDRICK, representative for R. & A. Main, Ltd., in the South, was entertained by some of his colleagues recently on the occasion of his 70th birthday. Mr. Shildrick, fit and alert as ever after 44 years' service with Mains, looks after not only his own Southern District, but also a good part of the Western ground for his absent colleague, Mr. (now Flt.-Lt.) K. H. Potter.

Obituary

The death occurred on Nov. 4 of Mr. W. H. HANDLEY, Managing Director of Messrs. Robert Dempster & Sons, Ltd., after a short illness.

Mr. Handley completed 50 years' service last June, when a presentation was made by the Chairman of the Company. He was appointed Works Manager in 1899, Joint Managing Director in 1927, and sole Managing Director in 1933. Mr. Handley was aged 66 years.

He was a Past-President of the Halifax District Engineering Employers' Association, a Member of The Institution of Gas Engineers, a Member of the Institution of Mechanical Engineers, and Past-President of Section 4 of the Society of British Gas Industries.

Letter to the Editor

Coke Sizing

DEAR SIR,—While I am in full agreement with the sizing of coke, I find myself in opposition to the nomenclature recommended by the I.G.E. Committee of Enquiry on Coke Quality. Future customers in their millions must visualize the size of coke they require. Why then should not direct sizing automatically be adopted as the nomenclature? Why saddle our prospective customers with the harsh onus of having to learn our artificial nomenclature, when there is no need whatever? The sizes should be known by their two limiting screens —*viz.*, max.–1¼ in., 3½ in.–1¼ in., 2 in.–1 in., 1¼ in.–½ in., ¾ in.–⅜ in., ½ in.–¼ in. As proof of the efficacy of this natural nomenclature, the Committee itself (as reported in the "JOURNAL" of Oct. 21) ingenuously and fully support me by saying "No. 3, 1¼ in.–½ in., is a satisfactory fuel for domestic hot-water supply boilers."

I suggest that a designation such as "No. 3" will prove in the long run a stumbling-block and a perpetual source of annoyance, destructive of the goodwill on which our prosperity so much depends.

43, Uxbridge Road, Hampton. Yours faithfully, H. J. TOOGOOD.

Nov. 2, 1942.

Institution of Gas Engineers

A special meeting of the General Purposes Committee of the Council of The Institution of Gas Engineers with representatives nominated by the Affiliated District Gas Associations and with the Director-General of Gas Supply (Ministry of Fuel and Power), presided over by the President of the Institution, was held at Gas Industry House on Nov. 3. The purpose of the meeting was to consider the work of any advisory bodies of gas engineers already operating in the Districts, and to discuss the setting up of similar bodies throughout the country to give advice and assistance that may be required by gas undertakings. In particular, the work already accomplished by the Panel appointed by the Midland Association of Gas Engineers and Managers was reviewed, and a description of typical cases which the Panel had been called on to assist proved clearly the value of the work and its usefulness to the Directorate of Gas Supply in ensuring the maintenance of gas supplies and in the cause of national fuel economy.

This scheme was a good instance of the practical desire of the Gas Industry to take in hand the solution of its own problems, with the collaboration and assistance of the appropriate Government Department.

The Director-General of Gas Supply expressed his warm appreciation of the work done by the Midland Panel, and strongly supported

the suggestion that similar bodies be set up forthwith throughout the country. Indeed, so important was the work that could be done by such panels that, if the Industry itself did not set them up, the Ministry would have to appoint them.

There was a general discussion of the type of membership most suitable for such panels, of the conditions peculiar to them, of mutual aid organizations already existing in the Districts, of the necessity of collaboration with the Regional Gas Engineering Advisers and the Regional Liaison Officers, and many other points of detail.

It was agreed that the most appropriate name for such panels would be "Gas Engineering Advisory Board."

The meeting agreed unanimously that a Gas Engineering Advisory Board of about six members should be set up forthwith by the appropriate Affiliated District Gas Associations for each of the Civil Defence Regions in which such an organization does not already exist, for the purpose of giving advice and assistance, primarily in regard to fuel economy, to gas undertakings in that Region. The areas to be covered by these Boards should accord as closely as possible with the existing Civil Defence Regions. The Board would be autonomous, but their activities and experiences would be co-ordinated by holding from time to time joint meetings of representatives of the Boards under the auspices of The Institution of Gas Engineers.

The District Representatives agreed to report immediately to the committees of their Associations, with a view to the appointment without delay of Gas Engineering Advisory Boards throughout the country.

Manchester District Association

A Meeting of the Manchester District Association of Gas Engineers was held in Manchester on Oct. 30. Mr. J. E. Lister Cooper (Yeadon) presided over a large attendance of members.

The following were formally inducted as new members of the Association: Geoffrey Fitton, Engineer and Manager, Thornton Cleveleys Gas Department; A. L. Higham, Engineer and Manager, British Light Company, Ltd., Hull.

The President then invested Mr. T. Reynolds (Stockport) with the Past President's Badge. He stated that the Association had been enabled to do so through the generosity of Mrs. Samuel Glover, who had kindly offered her late husband's medallion for the purpose.

Mr. T. Reynolds, in returning thanks for the presentation, referred to the Benevolent Fund of The Institution of Gas Engineers. Their Association had 169 members, of whom only 124 were contributors to the Benevolent Fund, or 72%. The percentage of contributors in the case of the Midland Association was 92. Of the 124 Manchester contributors there were only 37 who had signed the Deed of Covenant, or 29%. Promises to sign the Deed of Covenant would be thankfully received.

Officers were elected as follows:

President: William Fletcher (Liverpool).
Vice-Presidents: N. Hudson (Mirfield); C. H. Bamber (Rochdale).
Hon. Secretary and Treasurer: T. Haworth (Darwen).
Committee: J. D. Ashworth (Blackburn); H. Burton (Shipley); T. R. Cook (Blackpool).
Auditors: A. F. Yates (Goole); J. H. Richmond (Runcorn).

Mr. J. Corrigan, Engineer and Manager, Brighouse, then gave a Paper entitled "A Domestic Block Rate Tariff" (see last week's "JOURNAL" and p. 190 of this issue).

The President thought it was obvious from the rapt attention with which the members had listened to the reading of the Paper how much they appreciated the information it contained. It was to be remembered that the purpose of the Paper, as Mr. Corrigan had pointed out, was to present actual information on his actual experience, and he had done so without indulging in any trimmings of any kind. If from any point of view the scheme which had been embarked upon at Brighouse had not achieved the expected results, then Mr. Corrigan had stated so. The Paper would remain as a very valuable contribution to the records of the Association, for reference purposes.

There was no doubt that the Brighouse scheme was embarked upon after very thorough and methodical investigations into all the prevailing circumstances. Although the scheme had not brought about immense increases in average consumption per consumer, it had maintained the consumption per consumer. He was afraid that in many cases this could not have been said to have been the case.

Mr. Corrigan had stated in the Paper: "I suggest that in the future we are entitled to expect some continuation of this policy of protection against the loss of this specialized industrial business for which new plant has been erected." Especial emphasis should be laid upon this point.

Meetings of the London and Counties Coke Association will be held as follows on Nov. 16 at Gas Industry House: Finance Committee, 11 a.m.; Executive Committee, 11.30 a.m.; Central Committee, 1.30 p.m.

A **Meeting** of the Eastern District of the Southern Association of Gas Engineers and Managers will be held at Gas Industry House on Nov. 26, at 2.15 p.m., when Mr. G. L. Braidwood, Deputy Engineer, Southend Works of the Gas Light and Coke Company, will open a discussion with the title "The Trend of Thought To-day in the Gas Industry."

Manchester and District Junior Gas Association

The 44th Annual General Meeting of the Manchester and District Junior Gas Association was held in the Gas Showrooms, Manchester, on Oct. 3, the meeting being preceded by a luncheon at the Engineers' Club, at which the President of The Institution of Gas Engineers, Mr. E. V. Evans, and Sir Frederick West, Mr. Samuel Tagg, and Mr. George Dixon (Past-Presidents of the Institution) were present. The President (Mr. H. Platt) occupied the chair.

The Annual Report was read, and reference was made to the deaths of Mr. W. L. Heald, who was President in 1913–14, Mr. H. Burnet (Blackpool), a member of the Council, and Mr. J. Bridge (Elland), who was President in 1920–21 and who carried out the duties of Hon. Secretary for six years.

Last session two members of the Association were respectively awarded the Gold and Silver Medals of The Institution of Gas Engineers. Following on these successes, it was gratifying to learn that the Institution Bronze Medal had been awarded to Mr. J. B. Walsh (Stockport) for the Paper he read to the Association on the "Co-ordination of High and Low Pressure Gas Supplies." The National Gas Council (Manchester District) had invited the Association to appoint two representatives to serve on a District Committee for the purpose of commencing district discussions on post-war planning. Mr. W. Hodkinson and Mr. F. Johnston had been appointed.

Mr. T. V. Blake (Blackpool) had resigned from the Council, and Mr. F. Bell (Liverpool) was elected in his place.

The President declared that the following members were elected to the respective offices for the session 1942–43:

Junior Vice-President: H. H. Thomas.
Hon. Secretary: F. Johnston.
Hon. Treasurer: E. Kenyon.
Hon. Auditors: J. H. Cadman and F. A. Collier.
Council: E. Bates, F. Bell, D. Benson, F. Cartledge, E. B. Fields, W. Hodkinson, J. C. Hogg, and J. A. Speers.

Mr. Platt, installing Mr. J. Graham as President for the coming session, said that during the past four years he had received generous and willing support from Mr. Graham.

In acknowledging the honour, Mr. Graham presented Mr. Platt with a replica of the President's medallion, as a memento of his term of office as President.

Mr. Graham, referring to the presence of Mr. Evans, said he felt pride at the presence of the President of the parent Institution at his first meeting, but he also looked upon this visit as an indication of the interest which the President has taken in the views expressed by the members of the Association on the question of the reorganization of the Industry. He felt sure that it would lead to a better understanding between the Institution and the Junior Associations. Mr. Evans had not merely come to talk with the members upon the work of the Gas Research Board, but to invite questions and expressions of opinion from all, on the subject of the future status of Junior Associations and the post-war policy of their Industry. He believed that the contributions already submitted by some members of the Association would receive the full consideration of the responsible committees on post-war reconstruction, and he wished to make a plea for some greater consideration for the Junior Associations by The Institution of Gas Engineers, by granting them representation on their Council. He had no doubt that they would receive all possible assistance from the President in bringing this matter to the attention of the Institution Council. They were all conscious of the vast amount of work which the President had done for the Industry, both before and since his elevation to the Presidential Chair. The abnormality of the times multiplied exceedingly the load of personal responsibility which Mr. Evans would normally be called upon to bear.

Mr. Graham also extended a welcome to his late Chief, Mr. Dixon, of Nottingham, a past-President of the Institution, and a past-President and Hon. Member of their own Association. The present vigorous condition of the Manchester and District Junior Association is in a large measure due to the active interest Mr. Dixon had taken in its welfare and progress.

Mr. Evans then gave an Address which was followed with great interest.

A vote of thanks to Mr. Evans was proposed by Mr. H. H. Thomas (Liverpool) and was seconded by Mr. W. Hodkinson (U.K.).

Edinburgh Corporation Gas Showrooms were the scene of attraction all last week to large numbers of caterers, canteen cooks, cookery teachers, and others interested in providing the public with nourishing wartime potato dishes. The cooking arrangements were under the direction of Miss Lydall, of the Ministry of Food.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in the "Journal" should not be taken as an indication that they are necessarily available for export.

A DOMESTIC BLOCK RATE TARIFF*

By J. CORRIGAN

Engineer and Manager, Brighouse Gas Department.

(*Concluded from p. 167*)

TABLE 7A.—PERCENTAGE OF REVENUE FROM ALL CLASSES OF CONSUMER.

	1932.	1936.	1937.	1938.	1939.	1940.	1941.	1942.
Domestic Consumers—								
Ordinary and Sundry ...	31.9	...	...	...	...	...	...	...
Ordinary	...	19.6	20.4	18.3	17.6	17.6	15.7	14.7
Prepayment	48.2	48.9	46.3	48.4	47.7	47.4	45.1	43.2
Total	80.1	68.5	66.7½	66.7	65.3	65.0	60.8	57.9
Non-domestic	...	9.6	10.7	10.2	10.5	10.9	10.8	14.7
Industrial—								
Optional 4-Part Tariff ...	11.9	...	...	...	...	...	...	...
2-Part Tariff and Contracts	...	12.1	12.6	13.0	13.6	17.4	21.7	20.4
Power—								
Gas Engine Users	2.2	3.7	4.2	4.4	4.2	5.2	5.5	5.1
Central Heating	...	.4	.2	0.2	0.2	0.4	0.9	1.2
Street Lighting	5.8	5.7	5.6	5.8	6.2	1.1	0.3	0.7
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 7B.—SHOWING RELATION OF SALES TO REVENUE.

	1939. Gas Sales %.	Contributed.	1939. Revenue %.
Domestic :			
Ordinary ...	16.2%	,,	17.6%
Prepayment ...	36.6%	,,	47.7%
All Domestic ...	52.8%	,,	65.3%
Non-domestic ...	9.4%	,,	10.5%
Industrial and Commercial ...	19.2%	,,	13.6%
Gas Engines ...	7.3%	,,	4.2%
Central Heating ...	0.3%	,,	0.2%
Street Lighting ...	11 %	,,	6.2%

Typical Groups of Consumers

TABLE 8.—GAS LIGHTING.

Parlour Type Council House. Group of 10. Rateable Value £14. 3 Rooms downstairs, 3 Rooms upstairs. Prepayment Meters.

	Flat. Rate	Block Rate.								
	1932.	1934.	1935.	1936.	1937.	1938.	1939.	1940.	1941.	1942.
Average price—										
Per 1,000 cu.ft. ...	3/5	2/11	2/11	2/9	2/5	2/5	2/4	2/11	2/9	2/9
Per therm (pence) ...	8.20	7.00	7.00	6.6	5.8	5.8	5.6	7.0	6.6	6.6
Average annual expend.	100/3	76/5	79/10	74/7	68/7	70/1	72/7	84/6	92/3	91/2
Average weekly expend.	1/11	1/6	1/6	1/5	1/4	1/4	1/5	1/7	1/9	1/9

A number of consumers now fitted with electric light.

TABLE 9.—GAS LIGHTING.

Non-parlour Type Council House. Group of 10. Rateable Value £11. 2 rooms downstairs, 3 rooms upstairs. Prepayment Meters.

	Flat Rate	Block Rate.								
	1932.	1934.	1935.	1936.	1937.	1938.	1939.	1940.	1941.	1942.
Average price—										
Per 1,000 cu.ft. ...	3/4	3/1	3/-	2/9	2/6	2/6	2/8	2/11	3/1	3/1
Per therm (pence) ...	8	7.4	7.2	6.6	6.0	6.0	6.4	7.0	7.4	7.4
Annual expenditure ...	84/6	72/5	74/5	75/7	70/5	66/7	67/7	79/10	78/4	80/7
Weekly expenditure ...	1/7	1/7	1/5	1/5	1/4	1/3	1/4	1/6	1/6	1/7

A number of consumers now fitted with electric light.

TABLE 10.—ELECTRIC LIGHTING.

Non-Parlour Type Non-Council House. Group of 10. Rateable Value £10. 2 rooms downstairs, 2 rooms upstairs. Prepayment Meters.

	Flat Rate.	Block Rate.								
	1932.	1934.	1935.	1936.	1937.	1938.	1939.	1940.	1941.	1942.
Average price—										
Per 1,000 cu.ft. ...	3/6	4/3	4/3	4/-	4/-	3/10	3/10	4/3	4/6	4/8
Per therm (pence) ...	8.4	10.2	10.2	9.6	9.6	9.2	9.2	10.2	10.8	11.2
Annual expenditure ...	23/5	29/1	30/2	31/-	32/8	30/1	31/11	36/-	42/10	40/ 10
Weekly expenditure ...	5d.	7d.	7d.	7d.	7½d.	7d.	7d.	8d.	10d.	9½d.

* From a Paper to the Manchester District Association of Gas Engineers, Oct. 30

TABLE 11.—GAS LIGHTING.

Non-Parlour Type Non-Council House. Group of 10. Rateable Value £11. 2 rooms downstairs, 2 rooms upstairs. Prepayment Meters.

	Flat Rate.	Block Rate.								
	1932.	1934.	1935.	1936.	1937.	1938.	1939.	1940.	1941.	1942.
Average price—										
Per 1,000 cu.ft. ...	3/5	3/3	3/2	3/1	3/-	3/-	3/1	3/6	3/11	3/11
Per therm (pence) ...	8.2	7.8	7.6	7.4	7.2	7.2	7.4	8.4	9.4	9.4
Annual expenditure ...	53/4	58/3	58/2	56/-	55/4	52/7	52/5	52/10	55/7	56/9
Weekly expenditure ...	1/1	1/1½	1/1½	1/1	1/1	1/-	1/-	1/-	1/1	1/1

A number of consumers now fitted with electric light.

TABLE 12.—AVERAGE CONSUMPTION PER CONSUMER.

	See Table No. 8.		Table No. 9.		Table No. 10.		Table No. 11.	
	cu.ft.	therms.	cu.ft.	therms.	cu.ft.	therms.	cu.ft.	therms.
1932	28,920	144.7	25,170	125.9	6,700	33.5	15,380	76.91
1934	25,890	129.5	23,300	116.5	6,780	33.9	17,860	88.3
1935	27,050	135.2	24,450	122.3	7,090	35.5	18,140	90.7
1936	26,760	133.8	26,970	134.8	7,720	38.6	17,920	89.6
1937	28,580	142.9	27,930	139.7	8,150	41.8	18,150	90.8
1938	28,800	144.5	26,500	132.5	7,800	39.0	17,100	85.5
1939	30,630	153.2	25,400	127.0	8,270	41.4	16,800	84.0
1940	28,870	144.4	27,000	135.0	8,420	42.1	14,900	74.5
1941	33,010	165.1	24,400	122.0	9,490	47.5	14,000	70.0
1942	32,520	162.6	25,800	129.0	8,760	43.8	14,200	71.0

TABLE 13.—SELECTED LARGE DOMESTIC CONSUMERS (GAS AT 1939 PRICES).

All gas users (exclusion of solid fuel).

	Annual Consumption. cu.ft.	Therm.	Annual Expenditure. £ s. d.	Weekly Expenditure. s. d.
5-roomed house	125,900	629.5	9 16 4	3 9
6 ,, ,,	214,800	1074.0	15 15 6	6 0½
7 ,, ,,	123,400	617.0	9 12 4	3 8
7 ,, ,,	148,700	743.5	11 6 2	4 4
8 ,, ,,	187,700	938.5	13 19 0	5 5

Large users (with coal or coke).

8-roomed house	83,300	416.5	6 18 5	2 8
8 ,, ,,	95,800	479.0	7 15 1	2 11½
8 ,, ,,	126,400	632.0	9 16 8½	3 9½
8 ,, ,,	104,600	523.0	8 7 1	3 2½
8 ,, ,,	95,900	479.5	7 15 2	3 0
9 ,, ,,	112,800	564.0	8 17 1	3 4½

(*a*) Tables 8–12 represent groups of consumers not selected but taken in rotation from the meter books.
(*b*) The *all gas* consumers were obtained by the cheap gas rates.
(*c*) The following table shows the price at which gas was available to the large domestic users throughout the period of the tariff.

Differential Charges to Prepayment Meter Consumers

Reference to Table 1 shows that in 1936 our tariff was altered to allow prepayment consumers gas on the third block at the same price as the ordinary consumers. This removed one anomaly prevalent in the usual charges and which demands consideration.

Differential rates between ordinary and prepayment meter consumers exist in theory to recover the following items:

(1) The extra cost of the prepayment meter and its additional repairs.
(2) Extra cost of collection of prepayment meters.
(3) Additional maintenance, attending to coins fast, &c.
(4) The cost of any concessions granted by free or cheaper rented appliances.

In the earlier days of slot meters when consumptions were small the aggregate amount received through the differential charge would no doubt be required in full to meet the additional cost.

TABLE 13A.—SHOWING COST OF POTENTIAL DOMESTIC LOADS AT THE VARYING RATES. ORDINARY DOMESTIC CONSUMERS.

	Flat Rate.	Block Rate.								
	1932.		1933–35.		1935–39.		1939–40.		1940 to date.	
Per annum.	Cost per Annum.	Week.	Cost per Annum.	Week.	Cost per Annum.	Week.	Cost per Annum.	Week.	Cost per Annum.	Week.
	£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.	
20,000 cu.ft.; 100 therms ...	2 18 4	1/1½	2 15 6	1/0½	2 12 9	1/-	2 17 1	1/-	3 4 11	1/3
40,000 cu.ft.; 200 therms ...	5 16 8	2/3	4 9 3	1/8½	3 19 9	1/6½	4 8 9	1/8½	5 0 6	1/11
60,000 cu.ft.; 300 therms ...	8 15 0	3/4	6 3 0	2/4	5 6 9	2/-	6 0 5	2/4	6 16 1	2/7
80,000 cu.ft.; 400 therms ...	11 12 4	4/5	7 16 9	3/-	6 13 9	2/7	7 12 1	2/11	8 11 8	3/3½
100,000 cu.ft.; 500 therms ...	14 11 8	5/7	9 10 6	3/8	8 0 9	3/1	9 3 9	3/6	10 7 3	4/-
120,000 cu.ft.; 600 therms ...	17 10 0	6/9	11 4 3	4/5	9 7 9	3/7	10 15 5	4/2	12 2 10	4/8
140,000 cu.ft.; 700 therms ...	20 7 4	7/10	12 18 0	4/11	10 14 9	4/1	12 7 1	4/9	13 18	5/4
160,000 cu.ft.; 800 therms ...	23 4 8	8/11	14 11 9	5/7	12 1 9	4/8	13 18 9	5/4	15 14	6/-

The prepayment consumer now is numerically the largest class of consumer and the aggregate amount received from the differential is considerable. Our investigation in 1936 showed the larger consumers were penalized progressively under the tariff.

Differential Rate 5¾d. per 1,000 cu.ft.

Consumer using per annum.		Excess payment.
5,000 cu.ft.	...	2/4.75d.
10,000 „	...	4/9.50d.
15,000 „	...	7/2.25d.
20,000 „	...	9/7d.
25,000 „	...	11/11.75d.
30,000 „	...	14/4.50d.
40,000 „	...	19/2d.
50,000 „	...	23/11.50d.

The analysis showed that the actual extra cost to the Department for the prepayment meter system covering the above items 1–4 was 7s. per annum per prepayment consumer. The charges were accordingly altered allowing gas on the third block to be charged at the same rate to all consumers.

The differential was thus altered to—

4 quarters at 2,000 cu.ft. at plus 5d. per 1,000 = 3/4d.
4 „ 1,000 „ „ 6d. „ = 2/-
5/4d.

The concession to the prepayment consumers has amounted to over £1,000 per annum.

TABLE 14.—Theoretical Recovery of Service and Commodity Charges on Block Rate Tariff.

The rates of the first two blocks in the block rate tariff are designed to recover the service and commodity charges, leaving the third block to deal primarily with the commodity cost. The various net costs of the undertaking have been dissected from our annual statement of accounts in accordance with the manner recommended in the National Gas Council's report, and the following shows the service charge per consumer and commodity charge per 1,000 cu.ft. or per therm.

	Actual Dissection of Net Costs from Annual Account.			Excess Revenue received from Domestic Consumers through the first two Blocks of Tariff. Assumed as Service Charge.
	Service.	Commodity.		
Year.	Per Consumer. s. d.	Per 1,000 cu.ft.	Per Therm. d.	Per Consumer.
1932	29 4.8	1/8.2	4.04	... ...
1933	34 5.4	1/5.96	3.59	... ...
1934	31 3.4	1/5.22	3.44	... ...
1935	32 1.2	1/2.18	2.83	... 19/3.8
1936	34 5.4	1/1.76	2.75	... 21/0.6
1937	32 3.2	1/1.65	2.32	... 23/11.7
1938	33 2.4	1/3.91	3.18	... 25/10.2
1939	33 6.2	1/2.97	2.99	... 25/3.1
1940	32 9.6	1/4.62	3.32	... 23/8.8
1941	27 6.7	1/7.05	3.81	... 27/9.0
1942	27 10.6	1/8.31	4.06	... 28/0.2

(*a*) The service cost per unit consumer calculated on *all* consumers, no division between domestic and industrial.

(*b*) The actual contribution to service cost is lower than the theoretical cost owing to the desire to keep the rates of the two blocks as low as possible.

(*c*) The rates charged on the third block were slightly higher than the theoretical commodity charges.

(*d*) The various alterations to the block rate have not been made on strictly scientific calculations but to level out local anomalies.

Incidence of the Industrial Gas Consumption

Generally speaking the industrial gas load in this country had been developed largely in pre-war times as a result of the comparatively low charges for gas. These rates were made available because of the ability of the Gas Industry to fill up the gaps caused by reduced consumption from other sources, and for which there was surplus production plant in the country.

The industrial gas charges varied throughout the country as low as net cost into holder up to the top domestic rates, with the general average being in the nature of a commodity charge plus a small proportion of service charges.

Those undertakings catering for the industrial load were always faced with many factors affecting their normal production costs, such as—

A. Low rates for gas.
B. Seasonal and peak load demands.
C. Fluctuation of industrial process working.
D. Trade or business fluctuations.
E. Keen competition with other fuels.
F. Insecurity of business due to D and E.

The development of the industrial load has been greatly intensified in more recent years, with the result that most of the additional production plant now being provided by the Gas Industry is almost essentially for this particular load. This raises a point regarding security of future business. The position now is that gas as an industrial fuel is firmly established and accepted with potentialities for further development which are almost unlimited where heat processes are involved. At the present time the industrial load is somewhat protected by Government Directions which prevent a change-over to other fuels without consent of the appropriate department.

I suggest that in the future we are entitled to expect some continuation of this policy of protection against the loss of this specialized industrial business for which new plant has been erected, and further that we should obtain from industry a higher average price than we have received in the past. This may not mean a higher cost to the industrialist, since experimental and research work is aimed at increasing the efficiency in the utilization of the fuel to such an extent that a less quantity of gas is required for a particular process.

A higher average price from industrialists would ease the charges on the domestic consumer and would aim for levelling out of the revenue receipts. In the past the domestic consumer has paid in his higher price a contribution to the service costs of the undertaking; now the industrialists should pay a greater contribution to the increasing costs due to capital expenditure on plant erected mainly on his behalf.

Survey of Tariff Data

The main point in consideration of all our tariff analysis has been to keep an eye on the average consumption per domestic consumer, as I am convinced that this aspect of our business will in the future be of vital importance. Compared with those of ten years ago the results apparently do not show any progress, but I suggest the statement requires further investigation.

The analysis shows:

Average Consumption per Domestic Consumer.

	1934.		1942.	
	cu.ft.	Therm.	cu.ft.	Therm.
Ordinary domestic consumers ...	19,500	97.5	19,300	9.62
Prepayment domestic consumers ...	18,560	92.8	18,500	92.5
All domestic consumers ...	18,900	94.5	18,800	94.0

In order to obtain a true perspective of the published results of the domestic sales of any individual gas undertaking and to decide whether progress is being made, it is necessary to take into account many factors which affect the local position.

We have definitely offered gas for domestic purposes at rates competitive with any other fuel for all purposes. The prices have been increased only when rising costs of coal compel the course.

With regard to the general service the state of the complaints register is a sufficient guide, and ours indicates that there is little seriously wrong with our relation with the public.

As previously stated, prior to 1937 the showroom facilities were very poor, but constant demonstrations and exhibitions in various parts of the town were used with success. In 1937 new showrooms were opened and the following table shows the development in the sales and fixing of domestic appliances over the past 15 years:

TABLE 15.—Summary of Appliances Fixed. 1927–42.

	Simple hire.	Hire purchase.	Cash.	Total.
Fires	2,962	110	929	4,001
Cookers	6,779	607	317	7,703
Boilers	5,604	53	534	6,191
Washing machines	*Nil*	841	232	1,073
Hotplates	2,622	8	101	2,731
Water heaters	2,217	184	105	2,504
Radiators	264	22	63	349
Gas irons, pokers, &c.	*Nil*	424	651	1,075
Refrigerators	„	13	70	83
Total...	20,448	2,262	3,000	25,710

TABLE 16.—Net Gains of Appliances Fixed, after Allowance of Return to Works for Changes and Reconditioning, &c.

Year ended Mar. 31.	Fires.	Cookers.	Boilers.	Washing machines.	Hotplates.	Water heaters.	Radiators.	Gas irons, pokers, &c.	Refrigerators.	Totals.	No. of houses built.
1927	218	222	266	...	...	...	...	...	...	706 ...	68
1928	84	109	178	...	...	...	...	...	...	371 ...	40
1929	93	77	164	...	...	1	...	...	...	335 ...	19
1930	20	55	136	...	...	...	4	...	...	215 ...	29
1931	48	94	88	18	...	...	3	...	...	251 ...	66
1932	66	70	44	5	10	449	1	1	...	646 ...	70
1933	...	119	30	14	16	19	20	...	...	218 ...	100
1934	88	163	45	12	319	—46	17	43	...	641 ...	50
1935	152	177	69	47	343	—15	5	93	...	871 ...	86
1936	398	97	124	82	275	88	6	117	...	1,187 ...	144
1937	418	144	31	116	127	70	40	82	...	1,028 ...	141
1938	300	143	70	135	164	145	15	73	16	1,061 ...	230
1939	357	92	45	185	186	112	22	61	17	1,077 ...	138
1940	267	104	158	181	210	113	30	59	9	1,131 ...	131
1941	297	171	—6	192	150	84	9	145	16	1,058 ...	105
1942	161	121	86	8	19	64	8	398	20	885 ...	2
	2,967	1,958	1,528	995	1,819	1,084	180	1,072	78	11,681 ...	1419

(*a*) Table 15 is a record of the total appliances fixed upon the district and indicates the amount of work done by the fittings departments.

(*b*) Table 16 is most important especially where a simple hire system is in operation. The figures indicate the net position on the district after all returns are accounted for.

(*c*) The district has now 11,681 additional gas appliances compared with those of 15 years ago, although the number of domestic consumers has increased during the same period by 1,229, and new houses by 1,419.

(*d*) The average annual increase in the last nine years greatly exceeds that of the previous seven years, although electrical and other competition was at its keenest during the latter period.

Since 1932, 3,210 additional electrical consumers were connected, of which 1,217 are of new houses erected during the same period, leaving 1,993 new electrical consumers who previously used gas for the same purposes. Assuming each consumer had a minimum gas-lighting load of 4,000 cu.ft., then approximately 8 million cu.ft. represents the present annual loss of gas-lighting load.

The average annual expenditure for domestic consumers is £3 0s. 8d., with an average weekly expenditure of 1s. 2d. comparing with a corresponding figure of approximately 1s. 1d. for gas. The gas service, however, will cover the majority of cooking and water-heating requirements.

In pre-war the price of house coal for domestic consumers ranged from 1s. 6d. to 2s. 6d. per cwt., with an average of 2s. per cwt.

Summary of Impressions on the Operation of the Tariff

1. The block rate was designed to attract substantial additional business from solid fuel. In that particular sphere it has not achieved its object, but the scheme has been justified in the prevention of serious drop in the average consumptions of the domestic consumer.

2. It has yielded a considerable increase in the intermittent bedroom and occasional room type of heating in artisan houses, while sink water-heating business is popular. This is owing to the number of houses without hot-water system. Gas storage and circulator systems business is poor.

3. The cooking load has been retained and increased, but there is a tendency for a smaller type of cooker and greater use of separate hotplates.

4. Though the price is competitive with solid fuel the anticipated *all gas* business did not materialize. The few consumers who substituted gas for solid fuel entirely are satisfied and their annual consumptions of from 400/1,000 therms per annum indicates the potentialities of the business.

5. The main obstacle to progress is definitely the insistence on one coal fire.

6. The average weekly expenditure on fuel appears to be:

	Present.		Pre-War.
Gas	1/3d.	...	1/1d.
Electricity ...	1/2d.	...	1/2d.
Coal	5/-	...	4/-
	7/5d.		6/3d.

We still supply only 25% of the domestic fuel needs.

7. Certain gas business must inevitably be lost to competitors and no tariff can prevent it. An optional two-part tariff would not, in my opinion, have succeeded, as the commodity charge could not have been offered at any lower rate than on the third block.

8. The two-part tariff is a more scientific and equitable allocation of charges, but the results of optional tariff schemes show only a small percentage of domestic consumers are attracted. The Industry has for years asked for legislation for the compulsory two-part tariff, but I have grave doubts as to the reaction of consumers in low-rated houses who are called upon to pay separate standing charges for two fuels.

9. Competitive sales are handicapped by the absence of a smaller unit. Gas at even 4d. per therm all in conveys little to the domestic layman, but electricity at ½d. per unit gives the impression of the fuel being considerably cheaper than the fourpenny therm. A comparable fuel unit would be of great value. Sales talk was always directed to the equivalent amount of gas for one penny.

10. The operation of a rebate system through prepayment meters has assisted considerably with sales of appliances. Rents are collected through the rebate. We constantly checked the consumers' reactions to rebates or full cu.ft. value for one penny and found they prefer the larger rebate. The goodwill atmosphere during the meter collection period is improved.

11. The block rate is readily flexible for changes in prices. It has functioned equally well during wartime by adjusting the rates for different blocks.

Conclusion

I have endeavoured to give actual facts of our experiences and they reveal certain outstanding features:

1. Over 95% of our consumers still use coal in large or small quantities, and the preference for the coal fire is something which apparently cheap gas cannot overcome.

2. There is generally an element of suspicion as to the running costs of gas for prolonged periods of space heating, and the general public do not thoroughly understand the relative fuel costs.

3. We shall remain on the fringe of the domestic fuel business until some lead is given in the matter of a smoke-abatement policy viewed from the health services of the nation and the elimination of waste.

4. Some form of tariff is basically essential for the securing of this future business. The optional two-part tariff has not proved the solution. A compulsory two-part tariff with a minimum charge would appear in theory to be the most equitable form, but if consumers are to be allowed freedom of choice of fuel, then the full benefits of the tariff might be nullified. If, on the other hand, a compulsory form of tariff is not allowed, then I suggest the principles of the block system are worthy of further consideration.

Finally, I am convinced that gas can be placed in the domestic fuel market for all purposes at competitive prices, and by a process of educating the country into a keener appreciation of the national values of a smoke-abatement policy the potential domestic fuel business will be attained.

Discussion

Mr. **G. E. Currier** (Bradford), in a written communication, stated that the object of any promotional tariff was to secure substantial additional business, and this the Brighouse block rate had failed to achieve. The acid test must be consumption per consumer, and from the analysis of sales it was found that there had been no increase in consumption per domestic consumer. There had been an increase in consumption per prepayment meter domestic consumer, but this had been counteracted by the drop in consumption per ordinary meter domestic consumer.

The position then was that in Brighouse for the last ten years there had been in operation a most attractive domestic block rate tariff, one in which the price of gas was competitive with solid fuel. The attraction of the tariff could be seen from the statement in the Paper that 80% of the consumers availed themselves of the third block cheap gas rate by reason of their consumption of gas, and this was rendered possible owing to the low consumptions required in the first two block rates of charge.

In addition to an attractive tariff, there was evidence that the publicity, sales, and appliances policy generally had been of a most progressive type. Why had this progressive tariff failed. Mr. Corrigan regarded the coal fire as being the main obstacle, and to a large extent he (Mr. Crowther) was in agreement. He was convinced that the change-over from raw fuel for domestic purposes to smokeless fuel would never be achieved by voluntary methods, and that some degree of compulsion would be necessary. He regarded the ideal for post-war conditions to be an arrangement whereby each house paid one standing charge for the three utility services. In the case of houses on rental, arrangement should be made for such service charge to be collected as part and parcel of the rent of the house. If this ideal could be achieved, then all gas could be sold at a relatively low commodity rate from the start.

Mr. **R. Walker** (Manchester), in a written communication, remarked that there had continually been an outcry against tariffs on the ground that the small consumers coincided with the poor consumers, and it was interesting to note that in the analysis made by Mr. Corrigan, less than 10% could not afford to use more gas and thus take advantage of the reducing block rates. There was no economic justification for retaining the small consumers unless the charge for gas was sufficiently high to defray the standing charges. The block scale of charges outlined in the Paper fulfilled two of the main conditions of an ideal tariff—*viz.*, it was easy for the consumer to understand and it was simple for the undertaking to apply. Two-part tariffs were regarded with suspicion, and it was often difficult to persuade consumers to adopt them even when concrete evidence was produced to show that a monetary saving would be effected. The main purpose of tariffs, however, should be to increase sales and thereby reduce costs, thus enabling gas to be sold at even lower rates. Mr. Corrigan's statement that only 25% of the domestic fuel load was met by gas showed the possibilities that lay ahead of the Industry.

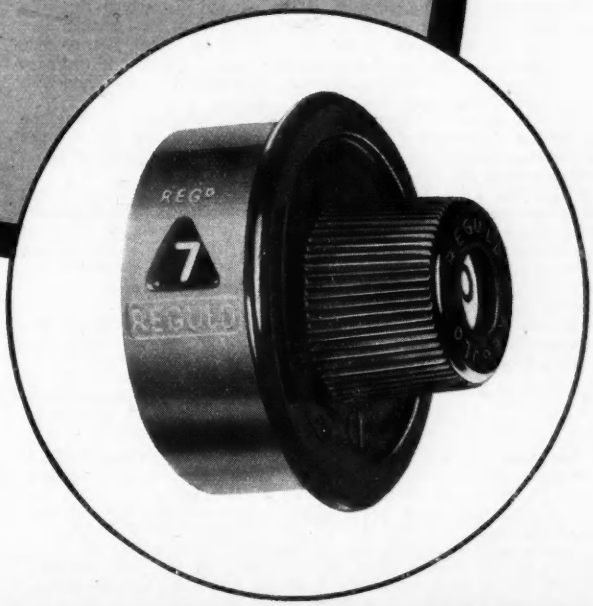
Mr. **H. Singleton** (Huddersfield), in a written communication, considered the block tariff as operated at Brighouse a success. Over the period of 1934–1939 a steady (if small) increase per ordinary meter consumer was shown; and over the period of 1934–1938 there was also an increase per slot consumer. Apparently in 1939 there was a 10% increase in slot consumers, and taking for granted that existing consumers maintained their consumption the new 10% averaged less than 2,000 cu.ft. each per annum, which would only return 5s. 8d. per annum in standing charges. A weakness of the block rate was that small consumers did not pay full service charges. Only a compulsory two-part tariff would give this, but as Mr. Corrigan rightly said, if one had legislation to apply a compulsory two-part tariff, would the consumer be prepared to pay two distinct service charges, when by paying only the electric one he could obtain a complete heating, cooking, lighting, &c., service on the lowest scale? On the other hand, he had yet to find an optional two-part tariff which had captured the imagination of 50% of the consumers.

The Brighouse tariff was successful because, if it did not greatly increase the consumption per consumer, it held what might otherwise have been a reduction per consumer during a time when gas lighting

...with our dinners!"

"The Surrey County Council have supplied us with a New World Regulo double-cooker. We find it most excellent for our School Canteen and are exceedingly pleased with it. We find we just cannot go wrong with our dinners"

(Signed)
Pamela Tew



Only the Regulo has the number in the triangle

was giving way to electricity. Huddersfield introduced a block tariff shortly after Brighouse, but in his opinion not quite so tempting. The scale was 4s. 6d. first, next 2s.–3s. 6d., next 2s.–2s. 8d., next 2s. There was no other reason for these particular terms except that from an analysis of consumption and grouping they were able to calculate that these were the best terms they could afford to offer in lieu of a 3s. 5d. flat rate. He was perfectly satisfied with its operation. It was applied to both ordinary and slot consumers, and there were no meter rents. He agreed with Mr. Corrigan that industrial gas should bear a larger share of the standing charges than was generally the case to-day.

Mr. **A. L. Jennings** (Spenborough) suggested that the answer to the fact that the gas consumption had not increased, although the lost business had been caught up and the position held, was due to the insistence of the public, particularly in the case of smaller houses such as prevailed largely in the Brighouse district and many others, on having one coal fire in the house. He agreed with Mr. Corrigan's view with reference to a small gas unit comparable with the electrical unit being necessary.

Mr. **H. Curtis** (Macclesfield) was somewhat surprised that Mr. Corrigan's ratio of gas consumption had not increased to any extent since the tariff had been introduced. Apparently the only increase had been on the industrial load; it had not obtained in regard to the domestic load, which was the backbone of the Industry. It was surprising to read the statement that Brighouse was "the first municipal undertaking to substitute a block rate for a standard flat rate tariff," for it was in operation in Macclesfield in 1922. It was found, in Macclesfield, that when these blocks were put in operation there was a definite incentive to increase gas consumption, and over that period they had increased their total consumption to the extent of nearly 80%. He could not agree with any policy which advocated the cutting-off of the so-called unremunerative consumer.

Instead of starting with a high price they should commence with the lowest one possible, because it was the smallest consumers who, in the aggregate, were the paying consumers, providing there was a sufficient number of them. It was not the people who had paid the first standing charge, who doubled the consumption in the first block or even increased ten times the consumption in the third block, who were providing the bulk of the money; it was the numerous consumers who were just on the border-line. Instead of crying out for Government assistance to make the small consumer fall into line, the charges should be so adjusted as to enable them to do it.

Mr. **N. Hudson** (Mirfield) said that to a great extent success in promoting gas sales depended upon having a reasonably cheap therm to sell, a good service backing up, and a good psychological way of approach to the consumer. In Mirfield they had tried a two-part optional course for 10 years, and in regard to quarterly consumers they had had an increase in sales in the 10 years from 46 millions to 63 millions, but the consumers had dropped from 1,368 to 1,279. Prepayment consumers, who constituted the majority of consumers, had not shown much success, but they had been experimenting before the war with mechanical means of collecting a quarterly charge in connexion with the two-part tariff scheme. Where they had educated the people to the value of a two-part tariff, even with slot meter consumers there had been a definite promotional tendency.

Mr. **J. W. Brearley** (Swinton) could understand why Mr. Corrigan found it necessary to reduce prepayment charges to the level of the ordinary consumers' charges. It had always been the practice of the slot meter consumer to pay his due charges for extra maintenance and collection, and he thought this was the general practice to-day, even in block systems and tariff charges. As a matter of fact, taking meter rents into consideration, he thought it would be found that in some cases the slot meter consumers were paying less than the ordinary consumers. In his opinion, all meter rents should be abolished with any tariff scheme.

Mr. **A. Allen** (Partington Gas-Works, Manchester) said that the general public were not yet sufficiently educated to the fact that gas was the best fuel to use, and until they were the rate of progress would be necessarily retarded.

Mr. **J. H. Clegg** (Marsden) thought the average consumer did not take kindly to two fixed charges for two commodities. The suggestion of having a fixed charge for a household which could be allocated among various departments of an authority which controlled the gas, electricity, and water undertakings was worthy of consideration. Was not the time opportune for the Gas Industry to press its case for the establishment of a minimum charge?

Mr. **A. K. Collinge** (Preston) proposed a vote of thanks to Mr. Corrigan, who responded.

Gas Consolidation, Ltd., has declared the usual half-yearly dividends on the 4% and 4½% Preference Stock for the half year ending Nov. 30, 1942, and interim dividends of 2½% actual (same) on the "A" Ordinary Stock and 2% actual (same) on the "B" Ordinary Stock for the year ending May 31, 1943, payable Dec. 1, 1942.

Peterborough Gas Company has declared the following dividends for the half-year ended Sept. 30, to be paid on Nov. 18: £5% per annum on the New Preference A shares, £7½% per annum on the Consolidated Ordinary stock (both less income-tax).

Western Juniors

A Meeting of the Western Junior Gas Association was held under the Presidency of Mr. A. Bell, of Exeter, at the offices of the Bristol Gas Company on Oct. 24, and took the form of a discussion on war-time problems under several headings. The points raised in the various discussions were informative and the meeting was voted an unqualified success.

The thanks of the Association to the Bristol Gas Company and to Mr. R. Robertson (General Manager) for facilities granted and for their hospitality was proposed by Mr. F. W. Sansom (Exeter) and seconded by Mr. J. T. Spencer (Weston-super-Mare). Mr. Robertson took the opportunity in responding to the vote of thanks to offer his congratulations, which were endorsed by all members, to the Asst. Hon. Secretary, Mr. F. W. Sansom, on the recent award of M.B.E. for his work during and after the recent heavy enemy attack on Exeter.

Yorkshire Juniors

A Meeting of the Yorkshire Junior Gas Association was held at Leeds University on Oct. 31 under the Presidency of Mr. F. Beaumont.

A Paper was read by Mr. N. G. Appleyard, of Leeds, on "The Distribution System of the Leeds Gas Department." Mr. Appleyard dealt with his subject with the aid of lantern-slides and photographs, making it extremely clear and instructive.

Mr. W. T. Hird (Sheffield) proposed the Association's thanks to Mr. Appleyard, and this was seconded by Mr. E. Bailey (Cleckheaton). Mr. Appleyard replied.

Professor Townend and the Council of the Leeds University were accorded the thanks of the Association for providing facilities for the meeting; this was proposed by Mr. H. Dearnley (Leeds) and seconded by Mr. F. Roberts (Bradford). Mr. H. J. Hodsman (Leeds University) replied on behalf of Professor Townend.

Royal Visit to Fuel Economy Exhibition

The Queen paid a private visit to the Fuel Saving Exhibition at Dorland Hall last Friday. Her Majesty was greeted by the Minister of Fuel and Power and by Commander Stephen King-Hall, Director of Publicity, and Mr. Misha Black, Ministry of Information, formerly of the Gas Light & Coke Company, who was responsible for the display, also accompanied her round the Exhibition.

Her Majesty showed considerable knowledge of the Fuel Saving Campaign and was particularly interested in the public's reaction. She was glad to know that the ordinary housewife could see evidence in the Industrial Section of the savings being effected in shops, offices, and factories, showing that the full burden was not falling on the domestic consumer. After talking to members of the Advice Bureau in each section, Her Majesty went into the demonstration theatre, where an oven-meal demonstration was in course of preparation—the demonstrators were both former Home Service demonstrators.

"Seeing is Believing"

In his Presidential Address to the Illuminating Engineering Society on Oct. 13, Mr. R. O. Ackerley said that as a cultural body the Society has a message to all concerned with lighting, on which the great majority of laymen hold definite views and expect to be consulted. It is necessary for the Society to get its message to such people, and also to convince the laymen that they are laymen before it can be hoped that they will listen to the experts.

He emphasized the importance of making contact with national and local bodies in some degree connected with technical problems and with the health and welfare of the community. Contact could be made by three methods—the printed word, the spoken word, and visual demonstrations. In telling a story with the printed word the arrangement and presentation of the subject are as deserving of careful consideration as in the case of the spoken Paper. The manner of layout, the choice of type, and the selection of paper are likewise of importance, though this is generally realized by few outside the ranks of publicity experts. This particular aspect has been the subject of special study by the Society in connexion with the preparation of a series of pamphlets dealing with lighting in connexion with after-war reconstruction.

In the concluding portion of his Address, Mr. Ackerley devoted himself to the subject implied by the title of the Address, "Seeing is Believing." He pointed out that in the field of lighting visual demonstrations were particularly valuable, and he selected half a dozen demonstrations illustrating most strikingly the important advantages of good lighting in relation to daily life. One or more such demonstrations might well be shown by every speaker on lighting, no matter how his audience was composed. In general such experiments with light have the merit of being so fascinating that they do not bore even those who have seen them previously.

United Kingdom Gas Corporation, Ltd., have declared an interim dividend of 2% (actual), less income-tax, for the year ending Dec. 31, 1942.

INDUSTRIAL GAS ECONOMY*

By EDMUND BATES, Manchester Gas Department

INDUSTRY is now using more gas than ever, and where supervision, regular maintenance, and correct adjustment can be applied, great returns are to be expected. As an instance, a recent saving of 5% in gas consumption was achieved on a gas-fired furnace using 3,000 cu.ft. per hour, thus releasing approximately 88 tons of coal per annum for other war purposes. In many cases a much greater saving than 5% can be effected; any effort in this direction is amply rewarded, and the Paper records some of the experience gained in an attempt to reduce the gas consumption of various types of gas-fired appliance on a large industrial area.

The main sources of waste can be classified under the following headings: (1) Bad adjustment of dampers, gas cocks, air slides, &c.; (2) absence of trained supervision coupled with operators' lack of knowledge of gas-fired plant; (3) lack of care and thought on the part of the operator; (4) badly designed or obsolete apparatus, also modern plant in need of repair; (5) poor organization resulting in heat being wasted due to lighting up and shutting down apparatus more often than necessary; (6) irregular gas pressure at burner manifold.

Oven Furnaces

In the oven type of furnace, the flames and products of combustion pass into the heating chamber, thus giving an efficiency some 25% higher than that of a similar size muffle furnace. It is obvious, therefore, that the latter should be used only where the oven type would be unsuitable. Most muffle furnaces can be readily converted if desired by removing the muffle and fitting a suitable refractory tile in the bottom of the heating chamber.

One of the main sources of avoidable heat loss is up the stack, but with careful damper adjustment, waste in this direction can be reduced to a minimum. Usually, the best results are obtained with a level gauge pressure in the combustion chamber. By applying a light to the sight hole in the furnace door, pressure, vacuum, or level gauge conditions can be observed readily and the damper adjusted to give the pressure required. The air and gas controls on the burners should then be adjusted to give a reasonably sharp flame, and the pressure conditions again checked and the damper readjusted if necessary. When the furnace has reached the normal working temperature, the above adjustments should be checked and modified if required, the settings then being marked on the controls, noted, and taken as final.

In many cases a reducing atmosphere is required, which means that a faint blue flame should be observed when the furnace door is opened quickly. A heavy blue or partially white flame indicates excess gas, and this can be avoided by checking back the gas or increasing the air (according to whether the temperature is too high or too low) on the burner adjustments, the individual gas burner taps being adjusted to give an even temperature throughout the length of the furnace. Once the correct settings have been found, they should be marked and noted.

Should a furnace be required to operate at different temperatures, the most economical settings should be carefully determined and the resultant positions of gas taps, damper and air slides noted in each particular case so that they can readily be reproduced. The application of testing apparatus gives a more accurate indication of the exact conditions prevailing, and should be used wherever possible if very close working is to be achieved.

Most modern furnaces either include a covering of insulating brick or employ insulating refractory brick in order to conserve heat. The latter type has the advantage of taking up less space, is cheaper, and consequently is becoming increasingly popular. Many old furnaces, however, incorporate no insulation, and in these cases a substantial saving in fuel can be effected by covering the furnace with a layer of insulating material, either bricks or composition. A coat of aluminium paint on doors and ironwork also helps to reduce heat losses due to radiation.

A source of unsteady operating conditions is variation in chimney pull. In some case, flues are connected directly to existing brick stacks, or carried to a great height before discharging to atmosphere. In the former case it is some time before the stack brickwork attains a steady temperature, during which period the pull on the furnace is constantly increasing and upsetting any conditions that may have previously been assumed correct. Furthermore, downdraught (which should not occur, of course, if the stack is taken above the highest point of the surrounding buildings in the immediate vicinity) might also play a part in wasting fuel, due to preventing sufficient air entering the furnace to give complete combustion of the gas. In very bad cases, downdraught can extinguish the flames altogether. By allowing a sufficient length of primary flue, say, 4 to 10 ft., according to the resistance of the internal flueways of the furnace, and fitting a baffler or hood, steady conditions are readily maintained and the danger and waste of fuel due to downdraught entirely eliminated.

Furnaces are too often lit by holding a piece of burning waste or paper, suspended on a piece of wire, over the burner port. There is always a tendency for pieces to drop down into the ports, and constant repetition of this procedure eventually results in inefficient operation. Also, on occasion, due to the flame going out, a charge of gas accumulates, which explodes on a further light being applied, thus opening up cracks and joints in the brickwork. A simple remedy is to provide a gas-lighting torch, fed from the burner manifold, and consisting of a thumb tap, flexible tube, and short length of ¼-in. iron pipe.

On closing down a furnace, the main damper, door and all air slides should be shut so that as much of the residual heat in the brickwork as possible shall be conserved in order to reduce the next heating-up period. The advantage of this procedure is evident if the shut-down periods are of short duration. The most economical method of using a furnace, however, is to run it continuously under full load rather than intermittently, and where possible the work should be arranged to meet this requirement. Expansion and contraction of the brickwork due to heating up and cooling down a furnace may result in joints opening up, with consequent waste of heat during operating periods. Where this occurs, the external joints should be picked out and pointed with a mixture of boiled linseed oil and fireclay, which sets hard and makes a lasting repair.

Where possible, particularly on larger furnaces, automatic control, preferably operating the gas, air, and stack valves, should be incorporated and properly maintained. In any case, an indicating pyrometer should be fitted so that heat is not wasted due to exceeding the temperature required, a condition which at times would also serve to give an inferior product. By the employment of temperature controllers, indicators, and recorders, the exact heat treatment conditions for any particular process can be readily reproduced, with consequent reduction of wasters. Every waster reduced means fuel and labour saved in previous operations. Thus a furnace adjusted to give the maximum production with the minimum gas consumption not only saves gas itself, but is an instrument for saving fuel in other processes.

Regenerative Furnaces

A correctly adjusted regenerative furnace will show a saving of some 15 to 20% of the gas that would be required to carry out the same duty in a non-regenerative installation. Control valves are fitted on the main gas, air and stack pipes, individual calibrated cocks being fitted to each burner (non-aerated type) as it enters the furnace. By these means accurate control is made possible.

Unfortunately, the workmen who operate these furnaces, which in this case are used for reheating billets prior to forging, are far more concerned with output than gas furnace operation. It is, therefore, not surprising that if no supervision is provided a large amount of gas is wasted. By correct adjustment, production can often be increased and gas saved. Once this has been proved to the men, the way is then open for additional refinements which can make still further economies possible. A number of drop-stampers have been trained on coal-fired furnaces and are used to seeing flames blazing out from the sides of every furnace door. The idea that this is correct for gas-fired plant will persist; and to obtain a similar effect, it was found that they closed the stack damper.

This method of operation has three serious drawbacks:

(1) The regenerators are rendered useless.

(2) As the stack damper does not close tightly, a small amount of waste products is inevitably drawn through by the exhaust fan. The heat content of these gases is not sufficient to maintain them above dew point, and consequently condensation takes place, which eventually corrodes the fan and change-over valve spindle making a shut down and renewals necessary.

(3) The front plate of the furnace is burnt away by the excessive heat, for which it is not designed.

To overcome these difficulties, the main gas, air, and stack valves were fitted with set-screwed cranks, so that they could be linked together and operated by a single lever. By providing a number of holes in the cranks and links, it is possible to adjust the travel of each valve so that at any point between "maintaining" and "full on" the correct relative positions are obtained. The initial adjustment was found by taking Orsat, pressure and temperature tests at various points between the maximum and minimum settings of the main control lever. Once set, the operator could not disturb the relative adjustment of the valves and production has since increased with reduced gas consumption. An economical stack temperature was found to be 120° C.

By reducing the number of changes-over to a minimum consistent with even heating gas can be saved. In this case a change-over period of 10 minutes is used for billets weighing 4 cwt., a period of 4 minutes being found the best for billets of ½ cwt.

(*To be concluded*)

* From a Paper to the North-East Lancashire Discussion Group at Burnley, Oct. 7.

Gas Products Prices

The London Market Nov. 9.

The only item of interest in connexion with the London Coal Tar Products market is that fair quantities of Pitch are being sold on the basis of 45s. per ton naked at Makers' Works. Otherwise no change.

The Provinces Nov. 9.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 90's, 1s. 10d., pure, 2s. 5d. (controlled by the Control of Toluene No. 2 Order, July 3, 1941, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 1s. to 1s. 4d. according to quality. Solvent naphtha, naked, North, 2s. 2d. to 2s. 6d. Heavy naphtha, North, 1s. 10d. to 1s. 11d. Carbolic acid, 60's, controlled by the Coal Tar Acids Prices (Inland) Order, 1942, operative from May 1. Naphthalene, controlled by the Naphthalene prices (Inland) Order, 1942, dated April 15, 1942, and operative from May 1, 1942, £19 to £19 10s.—bags free. Anthracene, controlled by the Anthracene Prices (Inland) Order, 1942, operative from May 1. Filtered heavy oil (min. gr. 1,080), 7½d. to 8d. Creosote oil has been generally controlled as to direction and price for some time past. Current value—fuel grades 5d. to 5¼d; timber preservation and other purposes 4¾d. to 6d. These prices apply as from May 13.

* In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10, 1941.

Tar Products in Scotland Nov. 7.

Market continues active with prices firm. Refined tar controlled. Value is 4½d. per gallon *ex* Works, naked. Creosote oil: Specification oil, 6¾d. to 7d.; low gravity, 7¼d. to 7½d.; neutral oil, 6¾d. to 7d. per gallon; all *ex* Works in bulk. Refined cresylic acid is changing hands at 3s. 6d. to 4s. 6d. per gallon *ex* Works, naked, according to quality. Crude naphtha: 6½d. to 7d. Solvent naphtha: 90/160 grade, 2s. 5d. to 2s. 6d., and 90/190 Heavy naphtha: 1s. 11d. to 2s. per gallon. Pyridine: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

Gas Stocks and Shares

The stock markets were active and firm throughout the whole of last week, particularly after the good news from Egypt, and the number of markings reached new records. Since the more speculative groups were heavily supported there was no great increase in the volume of business in the Gas Market. With one exception, however, the few price changes were in an upward direction, and in the case of the South Metropolitan preference stocks the increases were substantial. Moreover, several transactions were recorded at prices which appeared to justify some improvement in the quotations, *e.g.*, South Suburban ordinary at 84¾ against a middle price of 81½. The only drop was a slight reaction in Gas Light units which have risen in value considerably during the past few weeks.

The following quotations were changed during the week:

OFFICIAL LIST

Associated Gas & Water Undertakings Deferred	17/6—18/6	+–/6d.
Gas Light Units	15/9—16/9	–-/3d.
Imperial Continental	72—77	+2
Montevideo	85—90	+2
South-Eastern Gas Corporation Ord.	15/9—16/9	+–/3d.
South Metropolitan Ord.	67—72	+1
Ditto 6 p.c. Pref.	87—92	+5
Ditto 4 p.c. Pref.	70—75	+8
South Suburban 4 p.c. Pref.	78—83	+1
Tottenham Ord.	90—95	+2

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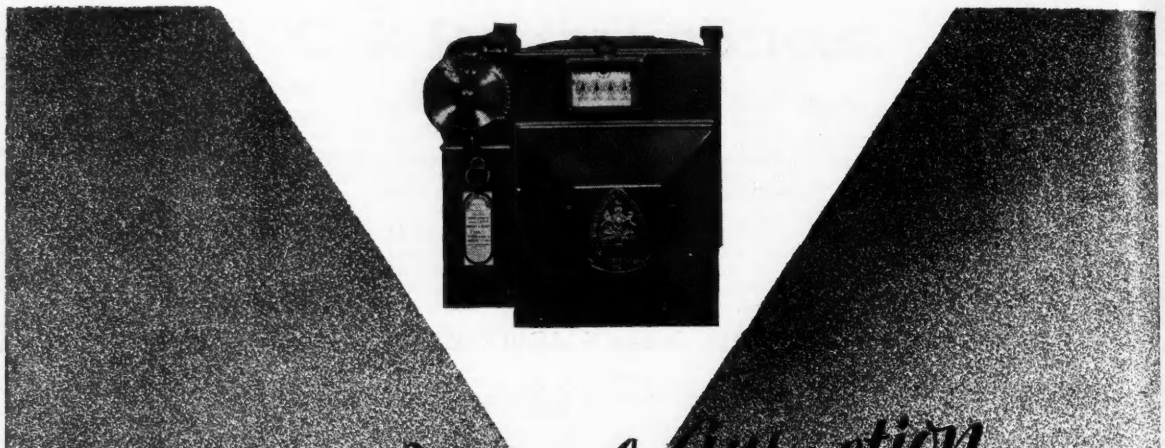

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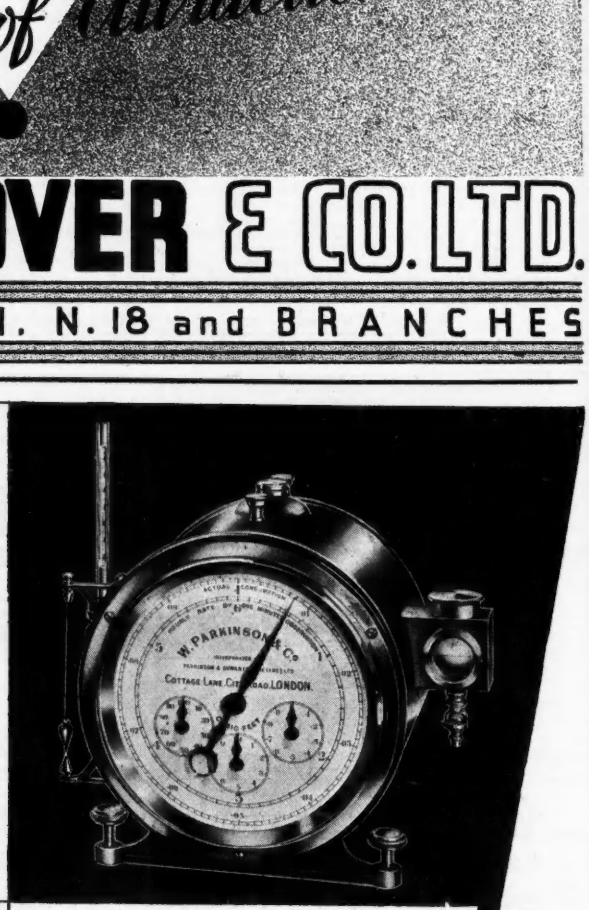

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